

ABSTRACT

An apparatus and methods are provided for cleaning a surface within a vessel. A vessel wall separates a vessel exterior from a vessel interior and has a wall aperture. An elongate conduit has an upstream first end and a downstream second end and is positioned to direct a shock wave from the second end into the vessel interior. A source of fuel and oxidizer is coupled to the conduit to deliver the fuel and oxidizer to the conduit. An initiator is positioned to initiate a reaction of the fuel and oxidizer to produce the shock wave within the conduit for generating the shock wave. A source of purge gas is positioned to introduce the purge gas to the conduit to drive reaction products of the fuel and oxidizer downstream.